

# **A New Strategy for the UK Microbial Culture Collections**

Government Response to the independent  
Review of UK Microbial Culture Collections

**OFFICE OF SCIENCE & TECHNOLOGY**

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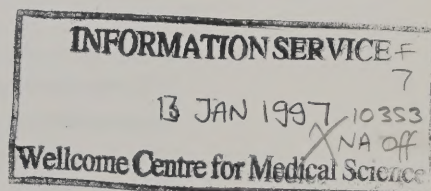


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## Introduction

1. In November 1994, the Government published the Review of UK Microbial Culture Collections<sup>1</sup>, the report of an independent team of experts, chaired by Professor Roger Whittenbury CBE of the University of Warwick.
2. The review arose initially from the report on Systematic Biology Research produced by the House of Lords Select Committee on Science and Technology in 1992. In the Government response<sup>2</sup> to this report, the then Chancellor of the Duchy of Lancaster, William Waldegrave, recognised the need for a coherent national policy on the UK's microbial culture collections and asked the Office of Science and Technology (OST) to commission an independent review of the collections in order to determine future national needs and help develop an appropriate strategy for the future.
3. The Whittenbury Review looked at ten culture collections which together comprise the UK national service collection:

International Mycological Institute<sup>3</sup> (IMI)  
National Collections of Industrial & Marine Bacteria (NCIMB)  
European Collection of Animal Cell Cultures (ECACC)  
National Collection of Type Cultures (NCTC)  
National Collection of Pathogenic Fungi (NCPF)  
National Collection of Plant Pathogenic Bacteria (NCPFB)  
National Collection of Wood Rotting Fungi (NCWRF)  
National Collection of Yeast Cultures (NCYC)  
National Collection of Food Bacteria (NCFB)  
Culture Collection of Algae and Protozoa (CCAP)



4. The review highlighted the fact that these collections are a high quality resource and a valuable national asset. Its key recommendation was that they should be established on a secure basis.
5. The review also recommended that the collections should be brought together under the aegis of the Biotechnology and Biological Sciences Research Council (BBSRC) and that BBSRC should determine the organisational infrastructure of the new arrangements. It further recommended that, where appropriate, rationalisation of the sites and responsibilities for specific culture holdings and services should be carried out. In all, it made eighteen detailed recommendations about marketing the collections, about rationalisation and other matters.
6. The Review raised important issues for the future of the UK microbial culture collections. The Government therefore announced in January 1995 that it would appoint a project officer to consider the findings of the review in more detail. This role has been carried out jointly by the Office of Science and Technology (OST) and



the BBSRC.

7. The project officers consulted widely on the future of the collections. The Government is grateful for the helpful contributions it received from industry and academia, as well as from other sources, as part of this process. Without exception, these emphasised the importance of microbial collections, either individually in performing their present roles or collectively in providing a UK resource with great potential for further development.

## ***Role of the UK Culture Collections***

8. In considering how best to respond to the recommendations of the Whittenbury Review, the Government has been conscious of the important role the collections already play individually, both in terms of supporting the policies of various Departments and agencies, and in underpinning the UK Science Base.

9. The ten collections operate under a range of different organisational arrangements. The Whittenbury report emphasised in particular the difference between the three stand alone collections – ECACC, IMI and NCIMB and the others, which are all embedded within parent institutions.

10. There are also some differences in the role and funding arrangements of the collections.

- i IMI is an international organisation, receiving funding from a wide range of Governments;
- ii ECACC, NCPF, NCWRE, NCPPB and NCTC are all collections attracting direct funding by Government Departments and carrying out scientific services on their behalf. These services are vital to the wider role of the departments concerned. At the same time, the collections are important resources for the wider UK science base;
- iii CCAP and NCYC are collections embedded within institutes funded by the research councils. They are important parts of the UK science base.
- iv Like the second group of collections, NCIMB and NCFB were initially collections funded by the Ministry of Agriculture, Fisheries and Food (MAFF), with a secondary role as resources for the wider UK science base. Changing departmental priorities have meant that MAFF no longer provide support. However, they remain important parts of the wider UK science base.

11. The diversity of these arrangements can be seen as both a strength and a weakness. However, as is laid out below [paras 12 to 24], there are good reasons for maintaining much of the current organisation, and this response focuses on how to build on the

strengths and minimise the weaknesses.

## **A New Framework**

### **Securing the Collections**

12. The Government believes that, in order to carry out their existing functions effectively, the individual collections need, in general, to retain their own identity and their existing relationship to their current funding bodies.

13. An exception to this are the two particular cases of NCIMB and NCFB. As noted above, these two collections no longer meet the particular needs of MAFI, their previous funding body.

14. Nevertheless, the Government recognises the strategic importance to the UK science base of both collections and their potential importance as a resource for UK industry. To strengthen their ability to perform this role, NCFB will be relocated to Aberdeen and merged with NCIMB. Both collections will be provided with Science Budget funding from BBSRC and additional money will be made available to pay for relocation costs of NCFB. However, this change in funding arrangements does not imply any transfer of ownership or responsibility for NCIMB or its staff to BBSRC.

### **A Co-ordinated Approach**

15. As described above [paras 8 to 11] the collections are important both for fulfilling scientific needs of their funding bodies and as part of the UK's base of scientific expertise and, potentially, an important resource for UK industry. The Whittenbury Review highlighted the need for them to function as a 'UK Cultures Collection' to realise this potential.

16. The microbial culture collections represent a considerable repository of microbial diversity. In the Government's view, the collections must be encouraged to on the one hand protect this repository and on the other hand maximise its exploitation. Modern biotechnology, in particular, offers new potential for exploitation of the resources offered by microbial biodiversity. Creating the preconditions to realising the potential of these resources is the key aim of these new proposals for the culture collections, which build on, but can not replace, the existing strengths of individual centres. The challenge is to create a system which maintains the diversity not just of the cultures the collections hold, but of the collections themselves, whilst building and exploiting relationships between them.

17. The Government will meet this challenge by introducing mechanisms to improve co-ordination of the culture collections. The ownership arrangements for the collections and all contingent responsibilities of the funding bodies will remain as described above and the collections will still respond to the needs of their current funding bodies. At the same time, their work will be co-ordinated and synergies



between them will be exploited.

18. There will be two main mechanisms to achieve this co-ordination.

19. First, the collections will be grouped together around three “nodes” for marketing purposes. These nodes will be directed towards particular user communities. An industrial node will centre on NCIMB; a medical node will centre on ECACC; and an agricultural and mycological node will centre on IMI. Each of the three nodes will provide a single point of contact for user communities, which will tap into the resources of the other UK collections. Some collections, for example, NCYC and NCWRF, may be aligned to two nodes.

20. ECACC, IMI and NCIMB already have considerable expertise in marketing and in total quality management. The intention is that the other collections should benefit from this expertise, not that they should be subsumed within the node collections.

21. For this system to work, individual collections will need to move towards full linkage of cataloguing and accession policies. OST will provide funding for a programme over three to four years to facilitate this and to support a co-ordinated marketing programme for the collections. It is envisaged that this will lead to an increase in sales revenue and that these new marketing arrangements will be able to continue without additional Government funding beyond the end of this term.

22. Secondly, improved co-ordination of the collections will be fostered by the BBSRC. BBSRC will set up a Culture Collections Advisory Group, terms of reference for which are provided at annex 1. The group will provide advice to BBSRC, the collections' management and their funding bodies on overall strategy and they will advise on: best practice for cataloguing and marketing of the collections; coordination of accessions policies; and, disbursement of funds allocated in support of the above objectives.

23. The group will consist of representatives from industry, Government and academia with the secretariat provided by BBSRC. The group will wish to give early consideration to how best to ensure that their deliberations benefit from the expertise of the collections' curators, and representatives of the three culture collection nodes will participate in those discussions not concerned with allocation of funds.

24. The activities of the Advisory Group must not, however, affect priorities for action agreed between the collections and their existing sponsoring Departments. The challenge for the collections and the Advisory Group will be to ensure that protection and exploitation of microbial biodiversity sits alongside and complements existing policy priorities, but does not compete with them.

## New Initiatives

25. In recognition of the future potential of the collections, OST will provide seedcorn funding for two new initiatives to enhance their value to UK industry:

1) the development of a new collection of animal viruses at ECACC. At present no national collection of animal viruses exists in Europe. These organisms are increasingly used in biotechnology, for example to transform animal and human cells. Such applications, and hence the potential for exploitation of a virus collection, can be expected to increase rapidly in the next few years. Government proposes to provide seedcorn funding over three to four years through BBSRC and will be looking for private sector investors to provide matching funds.

2) a programme of research on molecular characterisation of organisms. This will help identify genetic sequences responsible for different applications or indicative of phylogeny. This information is of increasing importance to the customers of the collections. A small competitive programme will be administered by BBSRC. All of the collections will be free to bid for funding under this programme.

## Response to individual recommendations of the Whittenbury Review

26. The Whittenbury review also made a total of six major recommendations and eighteen more detailed ones. The general line of the Government's response is outlined above. Specific responses to the individual recommendations are given below.

### Major recommendations

1. **The UK national culture collections are a high quality resource and a valuable national asset. They should be established on a secure basis for the future as a normal part of the underpinning science base of the nation. Living collections are as much part of our national heritage as are non-living collections.**

The Government recognises the importance of these collections. The new arrangements set out for them here should help to secure their future, whilst ensuring that they do not simply become museum pieces. The new role for the co-ordinated culture collection will help to establish a renewed partnership between the collections and their users, particularly industry, to facilitate the realisation of their potential.

2. **There is a need to promote more effectively the UK culture collections in an efficient and cost-effective way. We recommend that this be achieved by bringing the various repositories under the aegis of a single organisation which would develop a co-ordination and marketing strategy which builds on the strength of the individual centres.**



The Government accepts this recommendation. The new arrangements will encourage the collections to develop an umbrella single corporate identity. The Advisory Group that BBSRC will establish will provide a single forum for discussing appropriate aspects of policy across the UK culture collections.

3. **In line with the Government's establishment of the new Biotechnology and Biological Sciences Research Council (BBSRC) we recommend that overall responsibility for the UK culture collections be transferred to the BBSRC and that this additional responsibility should be fully taken into account when allocations are made to the Research Councils by the Minister for Science.**

BBSRC has an important role in ensuring that appropriate biological diversity is contained in the collections and in promoting the exploitation of the collections as a UK resource. BBSRC will provide support for the Advisory Group as a means to implement the new arrangements. However, the existing arrangements whereby the collections are responsible to their various funding bodies for the provision of services and the furtherance of policy objectives will not change. BBSRC will not take ownership of collections nor will it carry associated contingent responsibilities, for example for the funding of any expansion and/ or improvements.

4. **It should be for BBSRC to determine the organisational infrastructure of the new arrangements. Our advice would be that a steering group of experts from the science base and industry, drawn from outside the staff of the collections, should be appointed as the governing body of a new integrated national culture collection, with a salaried co-ordinator, also drawn from outside the culture collections.**

The Culture Collections Advisory Group will include representatives from the science base, industry and Government with the Secretariat provided by BBSRC. Representatives from each of the culture collection nodes will participate in those discussions not concerned with allocation of funds.

5. **Rationalisation of sites and of responsibilities for specific culture holdings and services should be carried out where appropriate.**

The NCFB will be transferred to Aberdeen and merged with NCIMB. No other move is envisaged at present.

6. **The outcome of the Government's current Scrutiny of Public Sector Research Establishments should take this report into consideration.**

The findings of the review were taken into account in the formulation of the Government's response to the efficiency scrutiny. The role of the collections will be taken into account in the current round of individual prior options reviews of establishments.



## Detailed recommendations

### Marketing

- (a) **To achieve more effective management and marketing, the UK collections should formally unite to form a single national collection (referred to hereafter as the UK Culture Collections - UKCC), policy for which would be steered by the proposed BBSRC board.**

The closer co-ordination of the collections will facilitate a co-ordinated marketing and management approach. The Advisory Group will provide a focal point for the development of broad consensus on the strategy and activities of the UK microbial culture collections and foster the development of a shared identity.

- (b) **The UKCC should develop a unified house style and should be professionally marketed and promoted from a central point. Member collections should contribute to a common catalogue and a co-ordinated electronic database.**

The Government agrees that a common catalogue and database will be important to present a unified house style. It is already possible to create a single catalogue on the internet. OST will make funding available through the Advisory Group to facilitate such moves. The funding will allow a three to four year marketing programme to pump prime an increase in sales. Marketing gains over the period will be the route to continued success.

However, the Government believes that marketing and promotion are likely to be more effective if they are targeted towards the particular markets that the collections serve. For this reason, there will be three market-related nodes, rather than a single point.

- (c) **IMI should become the focal point for marketing, under contract to the board of the UKCC and subject to periodic review.**

The marketing of the Collections will be run on the basis of three functional nodes, each focused on a particular market. IMI will be the focus for the agricultural-mycological node. The Advisory Group will be responsible for encouraging the adoption of best practice among the nodes and for monitoring performance.

- (d) **Non-recurrent funding should be made available for the launching of the UKCC and the setting up of a publicity and marketing centre at IMI.**

The Government will provide seedcorn funding over three to four years to improve marketing and cataloguing as well as for new scientific activities within the collections. Within this period, funding will be made available to the collections presenting bids intended to disseminate best practice on the advice of the Advisory Group.

- (e) **The ECACC should be affiliated to the UKCC.**

ECACC will be part of the UK cultures collection.

## ***Rationalisation of Sites and Services***

- (f) **The UK culture holdings should be focused on three major centres (IMI, NCIMB and ECACC) and one minor one (CCAP). Consideration should be given to devising suitable descriptive titles for these new groupings.**

The Government accepts that the Collections should be encouraged to collaborate and that there should be three nodes for marketing purposes. The Advisory Group will consider whether CCAP will benefit from affiliation to the node centred on IMI rather than operate as a minor node in its own right.

- (g) **IMI should become responsible for the sales and development of an expanded collection containing all of the UKCC's holdings of filamentous fungi and yeasts and plant pathogenic bacteria.**

The Government accepts that IMI should take the lead on marketing an expanded collection of filamentous fungi. However, holdings of plant pathogenic bacteria and yeasts should be marketed both from the IMI and the NCIMB nodes. Marketing strategy should be predominantly market driven, rather than just organism driven.

- (h) **The NCYC should be relocated to the IMI.**

The Government does not believe that there is a sound case for this. Synergy between the collections will be fostered through their common membership of the agricultural/mycological node. However, NCYC must strengthen links too with the industrial node. NCYC will remain located at the Institute of Food Research at Norwich.

- (i) **The NCPPB, NCPF and NCWRF should become satellite collections to IMI supplying their cultures to the UKCC under contract, for sale from IMI. The only exception would be any pathogenic fungi which IMI does not have facilities to handle; these should continue to be supplied from NCPF. The NCPPB would retain its statutory licensing authority.**

All of the collections will become full partners in a co-ordinated collection. The question of whether IMI or any other collection should act as a clearing house for sale and supply of cultures is a matter for the collections' own management to consider in consultation with their funding bodies, other members of their nodes and the Advisory Group. The formation of nodes in no way presupposes clearing house status for any collection.

- (j) The collection staff of the NCPPB, NCPF and NCWRF should be retained as consultants to the UKCC. They should continue to supply customer information relevant to their cultures and their curators should belong to a development committee for the expanded collection, chaired from IMI.**

The new arrangements are designed to create more effective and more formalised relations between the collections. The collection staff from NCPPB, NCPF, NCWRF, NCYC and IMI will collectively form the agricultural/ mycological node, but some will also participate in other nodes: for example, NCPPB can be expected to develop strong links with NCIMB. Partnership between them in developing their collections in response to customer needs will be essential, but all must be equal partners.

- (k) NCIMB Ltd should be responsible for the sales and development of an expanded collection containing all of the UKCC's holdings of non-pathogenic bacteria, and should become the focus for future accessions in this area.**

The Government broadly accepts this, although in some cases (eg opportunistic pathogens) it may be more appropriate for existing holdings to remain where they are. NCIMB will also market yeasts.

- (l) Urgent consideration should be given to the future funding of NCIMB Ltd.**

OST has made available additional funding to BBSRC to provide support for NCIMB. NCIMB will be encouraged to enter new markets and to develop its relationship with Aberdeen University and other research institutes. Expansion of the collection to include NCFB will further enhance its already good marketability.

- (m) The non-pathogenic cultures currently in the NCFB should be transferred to NCIMB Ltd. The pathogenic cultures should be transferred to NCTC.**

All NCFB accessions are to transfer to NCIMB.

- (n) ECACC should be encouraged to increase the scope of its collection to include plant and animal viruses and plant cell cultures.**

The Government agrees that ECACC should be encouraged to increase the scope of its collection. OST will provide seedcorn funding through BBSRC for the development of a new European collection of animal viruses at ECACC provided this is matched by the private sector (see paragraph 25.). ECACC will be encouraged to seek private sector funding for further expansion into new markets, so long as these moves are compatible with the aims set down by the Advisory Group.

ECACC has no interest in plant viruses.



- (o) **NCTC should be relocated to the Porton site and should be managed by ECACC, under contract to the UKCC. Consideration should be given to renaming the collection, since it is not an exclusive or comprehensive collection of type cultures.**

The Government does not accept this recommendation and considers that for the foreseeable future the medical profession's best interests are served by retaining NCTC within its current public health laboratory framework.

NCTC has recently appointed a new curator and has given a renewed undertaking to the Department of Health to develop the collection. The effectiveness of these new arrangements will be kept under review by the Department of Health.

- (p) **The preservation of both branches of CCAP is urged because of the value of the two curators in this very under-populated area of science. In the event that two sites cannot be sustained in the future, the economy of re-merging the two collections at one or other site should be considered. As a last resort, NCIMB Ltd could be asked to take on the collection and its staff.**

The Government accepts this recommendation.

## **Europe**

- (q) **Whilst seeking to encourage existing links with Europe, we recommend that the concept of a single European collection should not be pursued at present, but the UKCC should continue to seek to attract European funds.**

The Government accepts this recommendation. The co-ordinated collections will be expected to play a full part in seeking available funding from Europe and developing partnerships where appropriate with European Collections.

## **Research and Training Support**

- (r) **To foster the science base and the continued availability of trained personnel, the research councils should identify and support not more than three institutions that are capable of becoming centres of excellence in microbial systematics. These centres should develop "state of the art" programmes in microbial systematics research and deliver relevant training programmes (short courses and MSc degrees).**

The UK Systematics Forum, funded by OST, is currently considering priorities for a national strategy in all areas of systematic biology. They will take account of this recommendation in their deliberations. However, the new support announced in this response for molecular characterisation of micro-organisms will help strengthen an already strong UK capability in microbial systematics research.

## List of Acronyms

BBSRC	Biotechnology and Biological Sciences Research Council
CCAP	Culture Collections of Algae and Protozoa
ECACC	European Collection of Animal Cell Cultures
IMI	International Mycological Institute
NCFB	National Collection of Food Bacteria
NCIMB	National Collection of Industrial and Marine Bacteria
NCPF	National Collection of Pathogenic Fungi
NCPPB	National Collection of Plant Pathogenic Bacteria
NCTC	National Collection of Type Cultures
NCWRF	National Collection of Wood Rotting Fungi
NCYC	National Collection of Yeast Cultures
OST	Office of Science and Technology

<sup>1</sup> Review of UK Microbial Culture Collections: An Independent Review of the UK Microbial Culture Collections”, HMSO, November 1994.

<sup>2</sup> Systematic Biology Research – Government response to the First Report of the House of Lords Select Committee on Science and Technology, 1991-92 Session”, Cm 2243, HMSO, June 1993.

<sup>3</sup> IMI is an institute of CAB International and houses the UK National Collection of Fungus Cultures. It has International Organisation status in the UK.

## ANNEX 1

### CULTURE COLLECTIONS ADVISORY GROUP

#### TERMS OF REFERENCE

The Culture Collections Advisory Group will provide advice to BBSRC, the collections' management and their funding bodies on overall strategy. In particular, it will:

- i. act as a focal point for the development of broad consensus on the strategy and activities of the UK microbial culture collections and foster the development of a shared identity;
- ii. advise on best practice for cataloguing and marketing of the collections;
- iii. consider whether there are research, acquisitions or curatorial gaps in the UK collections and advise on how these might be addressed;
- iv. advise BBSRC on disbursement of funds allocated in support of the above objectives.

It will consist of representatives from industry, government and academia with the secretariat provided by BBSRC. Representatives of the three culture collection nodes will participate in those discussions not concerned with allocation of funds.





